REMARKS

I. Introduction

In response to the Office Action dated December 6, 2006, claims 1 and 16 have been amended. Claims 1-10, 12-25 and 27-30 remain in the application. Re-examination and re-consideration of the application, as amended, is requested.

II. Prior Art Rejections

A. The Office Action Rejections

On pages (2)-(7) of the Office Action, claims 1, 3-10, 12-16, 18-25, and 27-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,095,500 (Tayloe) in view of U.S. Patent No. 5,303,240 (Borras). On page (7) of the Office Action, claims 2 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tayloe and Borras and further in view of U.S. Patent No. 5,479,482 (Grimes).

Applicants' attorney respectfully traverses these rejections.

B. The Applicants' Independent Claims

Independent claims 1 and 16 are generally directed to operating a wireless network. Claim 1 is representative and comprises a method for operating a wireless network, comprising: (a) collecting and analyzing information from the wireless network into a collection and analysis system coupled to the wireless network, wherein the information includes location information on a plurality of mobile transceivers communicating with the wireless network; and (b) optimizing the wireless network's operation from a network control system coupled to the wireless network by intelligently steering radio frequency (RF) signal beams transmitted from the wireless network in the direction of one or more of the plurality of mobile transceivers using the collected and analyzed information.

C. The Tayloe Reference

Tayloe describes a system and method of evaluating the radio coverage of a geographic area serviced by a digital cellular radiotelephone communication system, which comprises a plurality of base stations each having a transmitter and a receiver and a plurality of mobile units having co-located transmitters and receivers for transmitting and receiving communication message signals between the base stations and a mobile unit. During operation, the position of at least one of the mobile units operating within the geographic area is located when a call is received by a base station.

The base station monitors the signal quality of the call and collects information relevant to the actual performance of the communication system. The mobile unit location and corresponding signal quality data are passed from the base station to a central operation and maintenance unit which collects the data, performs all necessary analytic and arithmetic computations, and provides a user-friendly representation of the characteristics of the radio coverage. With this representation of the radio coverage characteristics, the system operator can quickly and efficiently diagnose coverage deficiencies and take the necessary corrective action. By continuously monitoring subscriber calls and updating the pictographic representations, the system operator can actually observe the effect of the adopted modifications in a pseudo real-time fashion.

D. The Borras Reference

Borras describes a communication system for determining the optimum direction for transmitting and receiving a signal in a radio, which comprises a receiver for receiving a carrier signal being a time divided signal having an instruction signal, a transmitter for transmitting a time divided signal, a directional antenna coupled to said receiver and transmitter, and a steering device for changing the phase of the carrier signal in accordance with the instruction signal.

E. The Grimes Reference

Grimes describes a cellular terminal for transmitting information defining its location upon placing a 911 call. The cellular terminal includes a global satellite positioning (GPS) device; and upon the user of the cellular terminal placing an emergency telephone call, the cellular terminal interrogates the GPS device to obtain the geo-coordinates. The cellular terminal then transmits the geo-coordinates to a cellular telecommunication switching system. The cellular switching system or a public safety answering point (PSAP) system responding to the 911 call converts the geo-coordinates into location information. In addition, the cellular terminal transmits to the cellular telecommunication switching system pre-defined vehicle description information if the cellular terminal is being utilized within a vehicle. If the cellular terminal is a hand held unit, the cellular terminal can be programmed to transmit personal characteristics of the person using the cellular terminal. In another embodiment, the cellular terminal obtains the geo-coordinates from the GPS device and converts the geo-coordinates to location information using information stored internal to the cellular terminal. The location information is transmitted to the PSAP via the cellular switching system rather than the geo-coordinates.

F. The Applicants' Invention is Patentable Over the References

The Applicants' invention, as recited in independent claims 1 and 16 is patentable over the references, because it contains limitations not taught by the references. Specifically, the references do not teach or suggest the specific combination of limitations comprising: "collecting and analyzing information from the wireless network into a collection and analysis system coupled to the wireless network, wherein the information includes location information on a plurality of mobile transceivers communicating with the wireless network," and "optimizing the wireless network's operation from a network control system coupled to the wireless network by intelligently steering radio frequency (RF) signal beams transmitted from the wireless network in the direction of one or more of the plurality of mobile transceivers using the collected and analyzed information."

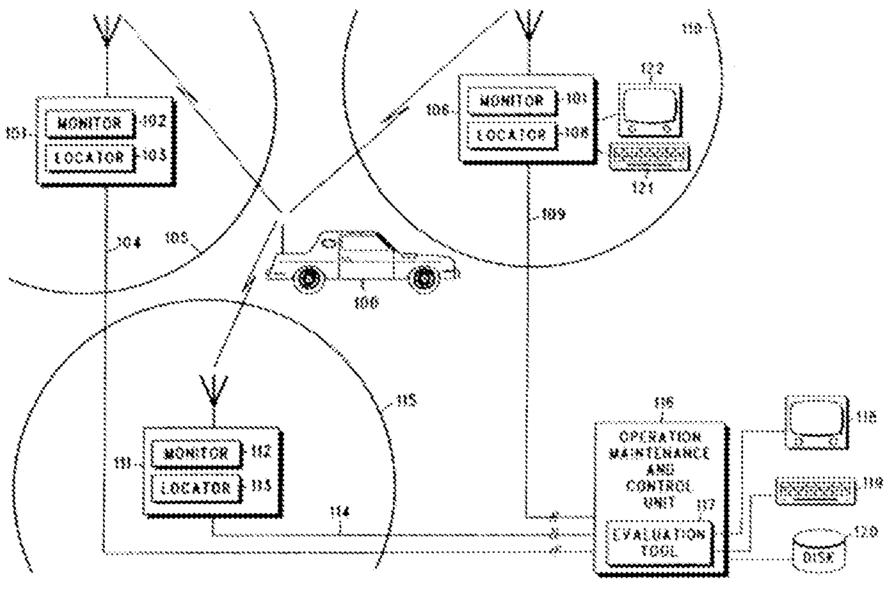
Nonetheless, with regard to the independent claims, the Office Action asserts the following:

> Regarding Claim 1, Tayloe disclosed a method for operating a wireless network (abstract), comprising:
>
> (a) Collecting and analyzing information from the wireless network into a collection and analysis system coupled to the wireless network (OMCU; 116; Fig. 1; Col. 5; 25-39), wherein the information includes location information on mobile transceivers operating within the network; (Col. 5; 25-39) and
>
> Tayloe fails to disclosed optimizing the wireless network's operation from a network control system coupled to the wireless network by intelligently steering radio frequency (RF) signal beams in the direction of one or more mobile transceivers using the collected and analyzed information. However, Borras teaches in an analogous art, that (b) Optimizing the wireless network's operation from a network control system coupled to the wireless network by intelligently steering radio frequency (RF) signal beams in the direction of one or more mobile transceivers using the collected and analyzed information. (e.g. sweeping the directional antenna to maximize the gain; Col. 2; 13-24, Col. 4; 49 - Col. 5; 3) Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Tayloe including optimizing the wireless network's operation from a network control system coupled to the wireless network by intelligently steering radio frequency (RF) signal beams in the direction of one or more mobile transceivers using the collected and analyzed information in order to offer an enterprise of a directional antenna to increase system gain in a limited <u>direction</u> by reducing the system gain in other <u>directions</u>. The use of a plurality of antennas and/or a means of <u>steering</u> a given number of antennas in addition to measuring signal quality (in a given <u>direction</u>) would allow the selection of a particular <u>direction</u> to achieve improved system gain. Antenna arrays are typically used to <u>steer</u> an antenna <u>beam</u> electronically.

Applicants' attorney disagrees.

At the indicated locations, the Tayloe and Borras references do not teach or suggest all the limitations of Applicants' claims. Instead, at the indicated locations, the Tayloe and Borras references merely recite the following:

Tayloe: FIG. 1



Tayloe: Col. 5, lines 25-65

As base stations 101, 106, and 111 communicate with device 100, information concerning the mobile unit location and the resultant signal quality is gathered and passed along lines 104, 109, or 114 to the Operation Maintenance and Control Unit (OMCU) 116. The OMCU is a centralized management tool within the communication system which supports the basic operation and maintenance functions required by each serviced base station. Via the terminal 119 and the CRT display 118, a system operator can access base station 101, 106, or 111 and alter various system parameters such as: transmitter power, transmitter frequency, frequency assignments, or software algorithms. In addition the OMCU provides the mass storage 120 and necessary computing power to support these operations.

Careful review of FIG. 1 reveals that the evaluation tool 117 is mated with the OMCU. The evaluation tool performs the required statistical analysis and correlation which relates the mobile unit's position with the resultant signal quality. As a function of these actual measurements, the evaluation tool is capable of providing a computer generated representation of the characteristics of the electromagnetic coverage. These representations, graphical or tabular, are presented to the system operator via CRT displays 118 or 122. Armed with this information, the system operator can easily plan, diagnose, or optimize the electromagnetic coverage of that communication system.

When corrective actions are required, the system operator can initiate previously mentioned alterations from the OMCU. Hardware specific alterations like:

increasing or decreasing antenna height, adding additional base stations, utilizing omni or directional antennae, or varying antenna shaping must be performed in the field. Upon completion, continuously monitoring subscriber calls within the affected area allows the evaluation tool to update the graphical representations for that areas. These updates, in turn, enables the system operator to quickly and efficiently evaluate the effectiveness of proposed solutions, and make additional changes as required.

Borras: Col. 2, lines 13-24

Referring to FIG. 1, there is shown a block diagram of a telecommunications system 100 that preferably uses an electronically controlled directional antenna in a portable communication unit such as a portable two way radio for aiming, steering, or "sweeping" the antenna. Preferably, the signal quality received at the portable communication unit determines the antenna steering. The best "signal quality" could mean the best signal strength, the best signal-to-noise (S/N) ratio, signal-to-interference (S/I) ratio, or other signal quality determining factor. This system is preferably for use in a portable transceiver and/or a base station.

Borras: Col. 4, line 49 - col. 5, line 3

Referring to FIG. 6, there is shown a typical algorithm that could be used with the present invention for the selection of an antenna direction. First, a transceiver would need to receive a "training" signal in the training time slot (402). Then the transceiver, (preferably the portable communication unit) would scan by "sweeping" the antenna (404) preferably using a scanning means and then measure the signal quality in each antenna direction (406) preferably using a signal quality measuring means. The best antenna direction is selected (408) preferably using a steering means which steers the antenna in the direction providing the best signal quality. Once the best direction is assigned, then normal communications can proceed (410). However, if it is later determined that the chosen direction is inadequate (412) or not optimal, another direction may be selected. For example, if the receive time slot is corrupted, the portable communication unit may about decoding the slot and use the remainder of the slot to "train" or select a new direction to use for the transmit time slot. Also, the algorithm may store the past history of directions (411), including alternate choices in order to make a better decision when choosing antenna direction.

In Tayloe, information concerning the mobile unit location and the resultant signal quality is gathered and passed to the Operation Maintenance and Control Unit (OMCU), which supports the basic operation and maintenance functions required by each serviced base station. However, Tayloe only suggests that various system parameters, such as transmitter power, can be altered.

In Borras, an antenna direction is selected by sweeping an antenna and scanning for the direction of the best signal quality. However, information is collected from a single antenna, but not the wireless network itself. Moreover, determining the direction of the best signal quality for a single antenna is not the same as collecting and analyzing location information on a plurality of mobile transceivers communicating with the wireless network. Finally, Borras merely selects a single

antenna's direction, based on the signals received by that antenna, but does not optimize a wireless network's operation by intelligently steering radio frequency (RF) signal beams transmitted from the wireless network in the direction of one or more of the plurality of mobile transceivers, using the collected and analyzed information.

As a result, the combination of Tayloe and Borras does not teach or suggest optimizing a wireless network's operation by intelligently forming RF signal beams transmitted from a wireless network in the direction of one or more of the plurality of using information collected from the wireless network system and then analyzed, wherein the information includes location information on a plurality of mobile transceivers communicating with the network.

Moreover, it is the Office Action that provides the motivation to combine the teachings of the references, rather than the references themselves. Consequently, it is only via hindsight that the Office Action could assert such a combination, or suggest a motivation to combine.

Further, Grimes fails to overcome the deficiencies of Tayloe and Borras. Recall that Grimes was only cited against dependent claims 2 and 17, and only for teaching E911 location information. In addition, Grimes does not teach the use of E911 location information in the same context as Applicants' invention, i.e., optimizing the operation of a wireless network, but only in the context of provisioning emergency services.

Finally, the various elements of Applicants' claimed invention together provide operational advantages over Tayloe, Borras and Grimes. In addition, Applicants' invention solves problems not recognized by Tayloe, Borras and Grimes.

Thus, Applicants' attorney submits that independent claims 1 and 16 are allowable over Tayloe, Borras and Grimes. Further, dependent claims 2-10, 12-15, 17-25, and 27-30 are submitted to be allowable over Tayloe, Borras and Grimes in the same manner, because they are dependent on independent claims 1 and 16, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-10, 12-15, 17-25, and 27-30 recite additional novel elements not shown by Tayloe, Borras and Grimes.

III. Conclusion

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited.

Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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